CLAIMS

What is claimed is:

1. A device for detecting the signal on a defect disc, said device comprising:

a servo control unit handling related electromechanical devices of said device;

a preamplifier receiving data from a lens and generating an RF signal for data process, servo control signals for said servo control unit and various signals for defect detection;

a slicer receiving and digitalizing said RF signal so as to generate digitalized RF signal;

a phase lock loop (PLL) synchronizing said digitalized RF signal to a system clock and counting the length of said digitalized RF signal;

a decoder decoding the length of said digitalized RF signal to a host;

a defect detection unit receiving said various signals for detecting different kinds of defects to set corresponding defect flag signals, wherein said defect detection unit includes means for ADefect1 detection, means for EFMDefect detection, means for RPDefect detection, means for Interruption detection, means for ADefect detection, and means for DSPDefect detection;

a logic combination unit running a suitable logic operation on said defect flag signals for detecting a particular defect.

2. The device according to claim 1, wherein said related electromechanical devices include a spindle motor, a sled motor, and means for a lens slightly tracking and focusing move.

3. The device according to claim 1, wherein said servo control signals further includes a focusing error (FE) signal and a tracking error (TE) signal.

4. The device according to claim 1, wherein said various signals at least include an envelope signal of said RF signal.

5. The device according to claim 1, wherein said defect detection unit further receives eight to fourteen modulation (EFM) signals from said slicer and said PLL.

6. The device according to claim 1, wherein said means for ADefect1 detection compares said envelope signal with a first threshold level, which is higher than an usual defect detection level, and sets a first corresponding flag signal when said envelope signal is lower than said first threshold level.

7. The device according to claim 1, wherein said means for EFMDefect detection further includes:

comparing a data frame of said RF signal with a first predetermined data length, and setting a second corresponding flag signal when more than n1 RF patterns are shorter than said first predetermined data length;

comparing said data frame of said RF signal with a second predetermined data length, and setting said second corresponding flag signal when more than n2 RF patterns are longer than said second predetermined data length;

comparing said data frame of said RF signal with an serious data length, and setting said second corresponding flag signal when more than n3 RF patterns are longer than said serious data length; and

resetting said second corresponding flag signal after more than n4 RF patterns are between said first and said second predetermined data lengths.

8. The device according to claim 1, wherein said means for RPDefect detection compares an RFRP signal with a third threshold level, which is higher than said usual defect detection level, and sets a third corresponding flag signal when said RFRP signal is lower than said third threshold level.

9. The device according to claim 1, wherein said means for Interruption detection compares said envelope signal with a fourth

threshold level, which is higher than an normal envelope signal, and sets a fourth corresponding flag signal when said envelope signal is higher than said fourth threshold level.

10. A method for detecting the signal on a defect disc, said method comprising:

utilizing ADefect1 detection for detecting a shallow defect and a fingerprint and generating a first corresponding flag signal;

utilizing EFMDefect detection for detecting an abnormal data length and generating a second corresponding flag signal;

utilizing RPDefect detection for detecting a small defect and a data interruption and generating a third corresponding flag signal;

utilizing Interruption detection for detecting said data interruption and generating a fourth corresponding flag signal;

utilizing ADefect detection for detecting a deep defect and generating a fifth corresponding flag signal;

utilizing DSPDefect detection for detecting a defect through a variable threshold and generating a sixth corresponding flag signal; and

running a suitable logic operation on said first, said second, said third, said fourth, said fifth, and said sixth corresponding flag signals for detecting a particular defect.

11. The method according to claim 10, wherein said ADefect1

detection compares an envelope signal of an RF signal with a first threshold level, which is higher than an usual defect detection level, and sets said first corresponding flag signal when said envelope signal is lower than said first threshold level.

12. The method according to claim 10, wherein said EFMDefect detection further includes:

comparing a data frame of said RF signal with a first predetermined data length, and setting said second corresponding flag signal when more than n1 RF patterns are shorter than said first predetermined data length;

comparing said data frame of said RF signal with a second predetermined data length, and setting said second corresponding flag signal when more than n2 RF patterns are longer than said second predetermined data length;

comparing said data frame of said RF signal with an serious data length, and setting said second corresponding flag signal when more than n3 RF patterns are longer than said serious data length; and

resetting said second corresponding flag signal after more than n4 RF patterns are between said first and said second predetermined data lengths.

13. The method according to claim 10, wherein said RPDefect

detection compares an RFRP signal with a third threshold level, which is higher than said usual defect detection level, and sets said third corresponding flag signal when said RFRP signal is lower than said third threshold level.

14. The method according to claim 10, wherein said Interruption detection compares said envelope signal with a fourth threshold level, which is higher than an normal envelope signal, and sets said fourth corresponding flag signal when said envelope signal is higher than said fourth threshold level.